Deployment of Dell M6348 Blade Switch with Cisco 4900M Catalyst Switch (Simple Mode)

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May 2011

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SUMMARY

Adding a Dell™ PowerConnect™ blade (M-Series) switch, within a Dell PowerEdge™ M1000e modular blade enclosure, to an external Cisco Catalyst Switch is a straightforward process. The addition of Simple Switch Mode on the Dell PowerConnect™ Blade switch further simplifies the process, allowing integration into existing network with minimal effort. This document is part of the Simple Connect campaign that includes both Simple Connect for SAN and Simple Connect for LAN –targeted at today's Fibre Channel (FC) SAN and Ethernet LAN environments and meant to serve as a supplemental guide on how to interconnect equipment within the Data Center.
This document provides an easy to use step-by-step guide on how to configure and deploy the DELL™ M-Series 1Gbit/s Blade Switch (M6348) (Figure 1) with a Cisco Catalyst 4900M Switch.

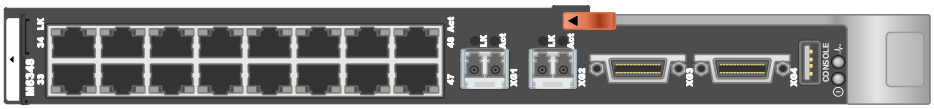

Figure 1: The Dell PowerConnect™ M6348 switch

Simple Switch Mode

Simple Switch Mode, or SSM, allows server administrators (even those with minimum networking expertise) the ability to deploy a loop-free switching solution without having to configure the Spanning Tree Protocol (STP) or worry about STP compatibility or interaction with the existing environment.
The primary advantages of deploying SSM are:

- Port Aggregation is easy to configure. Simply group internal ports and associate with external ports, assign VLANs (if required), and it's ready to go.
- Automatic configuration of the external ports into a Link Aggregation Control Protocol (LACP) trunk group.
- Providing loop-free topologies without using STP.
- Port Aggregation is completely interoperable. Dynamic (via LACP) and static link aggregation is supported on the external ports.

To enable Simple Switch Mode on a Dell PowerConnect M6348 switch, perform the following steps via Command Line or Web Interface:

Command-Line Interface:

From global config enter the following commands

```
config# mode simple
config# ip address vlan 4022
config# port-aggregator group 1
config# exit
```

Later versions of the firmware will not require a reload of the switch, however some earlier versions do. Reload the switch if requested. You can run the "show run" command again to verify you are in Simple Mode. This can be seen within the first 5 lines of the running configuration.

look for: !System Operational Mode "Simple"

Web Interface:

Follow the steps below:

- Log into the switch.
- Select System → Operational Mode →Operational Mode Configuration.

In the Operational Mode Configuration screen, select *Enable* in the *Simple Mode* drop-down menu, and left-click *Apply Change*s (Figure 2).

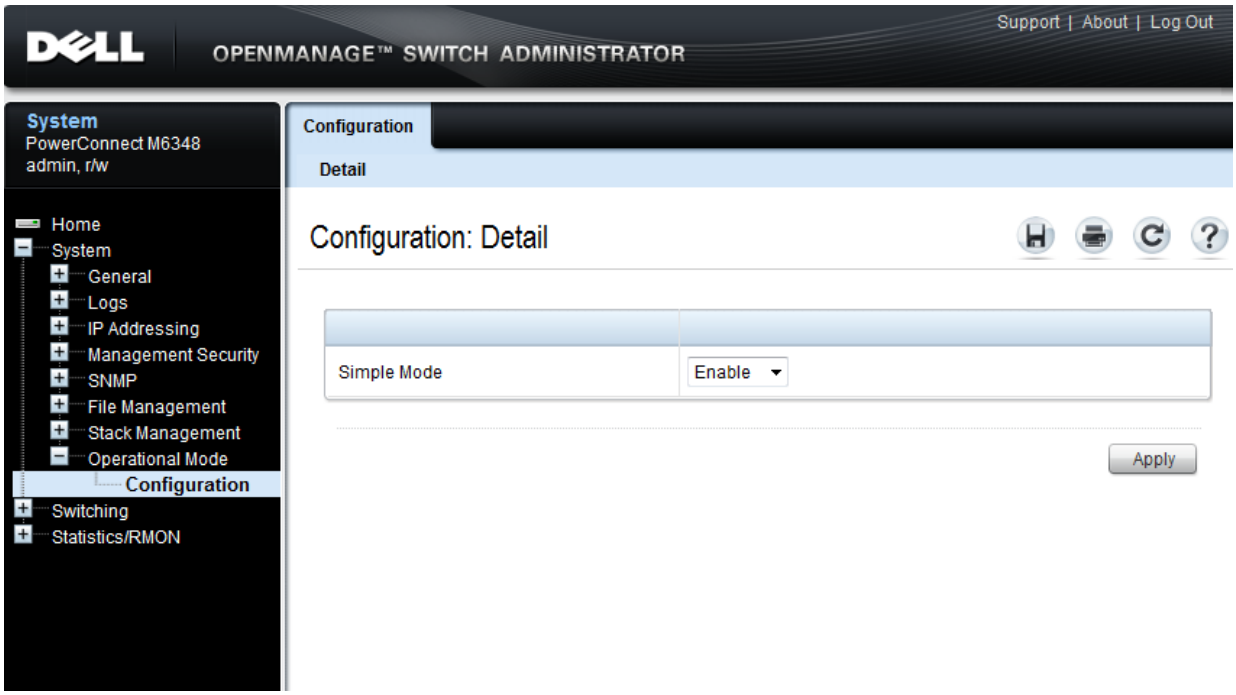

Figure 2: Simple Mode configuration on the Dell PowerConnect M6348 switch.

M6348 Firmware Versions 4.1 and 3.1

Command line and Web interface examples in the main body of this document are shown using M6348 firmware version 4.1.0.6. If you are using firmware version 3.1.x.x, Appendix A provides CLI and Web interface screens for the first three scenarios, using firmware 3.1.5.7 for those examples. One primary difference between the two firmware versions is how ports are addressed. For 3.1.5.7 the ports are shown as x/y, where x is the device and y is the port. If you are using firmware 4.1.0.6 on the M6348 then your ports will show up as x/y/z, where x is the device, y is the module, and z is the port. For example:

firmware 3.1.x.x	firmware 4.1.x.x
1/g33	Gi1/0/33
1/xg1	Te1/0/1

- All Scenarios 1–6 are shown using the 4.1 firmware; however Appendix A also includes 3.1 screens for the first three Scenarios.

TESTING SCENARIOS

In the sections that follow, we present an overview of a variety of different network deployment scenarios and then provide step-by-step set up guidence using configuration tools with screen shots as a visual guide. Intent of the paper is to show how some of the features of Simple Switch firmware can be used to easily and quickly configure both equipment to work with each other without requiring extensive knowledge of network.

Scenario 1: Plug and Play the Dell PowerConnect M6348 Switch

In this section, we will setup a basic network connection between the PowerConnect M6348 blade switch and the Cisco Catalyst 4900M to allow a Dell blade server to connect to the Cisco Catalyst through the PowerConnect M6348.

By default, all internal ports and the first 8 external ports of a PowerConnect M6348 are in port-aggregator group 1, but this can be changed by the user. All ports (internal and external) within a port aggregator group can communicate. There is a maximum of 8 *external* ports in any port-aggregator group. When one or more cables are plugged into external ports of the same port-aggregator group and in the same LAG role (primary or secondary) they are automatically in a LAG (link aggregation group). Secondary LAG roles are for backup LAGs in case of a LAG failure.

- External ports don't need to be side by side to be in the same port aggregator group. For example, ports 33 and 40 can be in group 1 and ports 34 and 35 can be in group 2. Having multiple external Ethernet ports of different speeds (e.g. 1G and 10G) in the same LAG is not supported, however they can be in the same port-aggregator group as long as one speed is used as a primary LAG and the other as a secondary (backup) LAG. All ports in a port-aggregator group only go to a single destination, which eliminates the need for STP.

- Upstream switches should have port-fast enabled on any links connected to an external port of an M6348 while in Simple Mode. Internal ports of an M6348 are not active unless there is at least one active external connection.

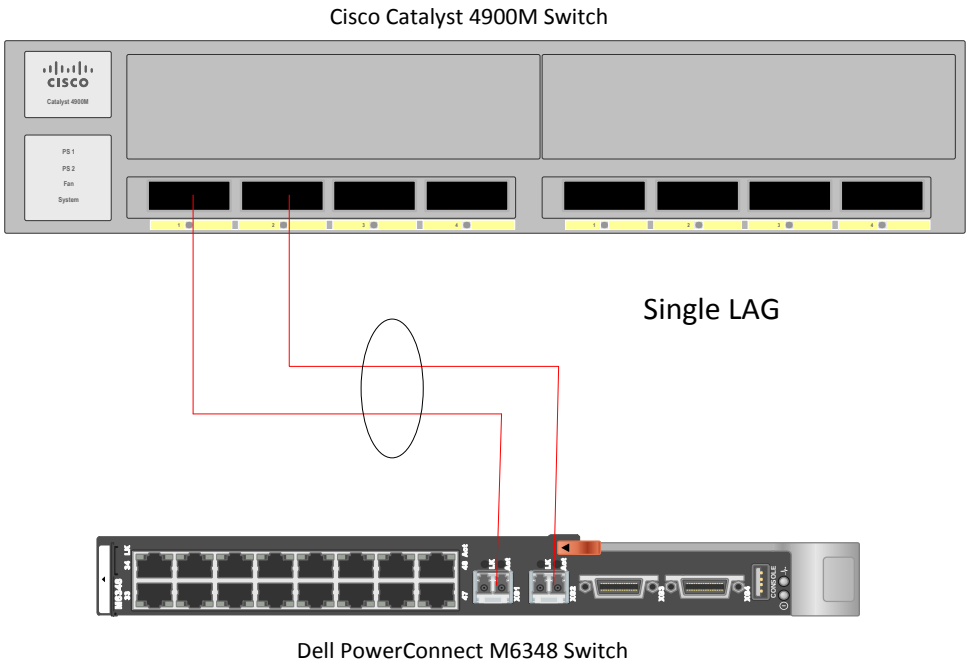

Figure 3: Graphic representation of Scenario 1

Configuring the Dell M6348 Switch

Command-Line Interface:

By default external ports 33 through 40 (1GB ports) are in port-aggregator group "1". In this example, we'll remove these ports from group "1" in order to add two 10GB ports (*Xg1* and *Xg2*) to the group. Figure 4 shows the command-line interface for configuring Dell M6348 switch using firmware version 4.1. For details on formware 3.1 please refere to Appendix A.

```
console#config
console(config)#port-aggregator group 1
console(config-portAggr-group-1)#no add interface gigabitethernet 1/0/33-40
console(config-portAggr-group-1)#add interface tengigabitethernet 1/0/1-2
console(config-portAggr-group-1)#exit
console(config)#exit
```

Figure 4: Command-Line Interface for Dell M6348 Switch for Scenario 1

Web Interface:

Follow the steps below:

- Select Switching > Port Aggregator > Port Configuration.
- Select only the ports you want to use in the group by removing or placing the group number in the field beside the port. For this example we removed the "1"'s beside Gigabit ports 33 – 40 (Figure 5) and placed a "1" in the fields beside Te1/0/1 and Te1/0/2 (Figure 6).

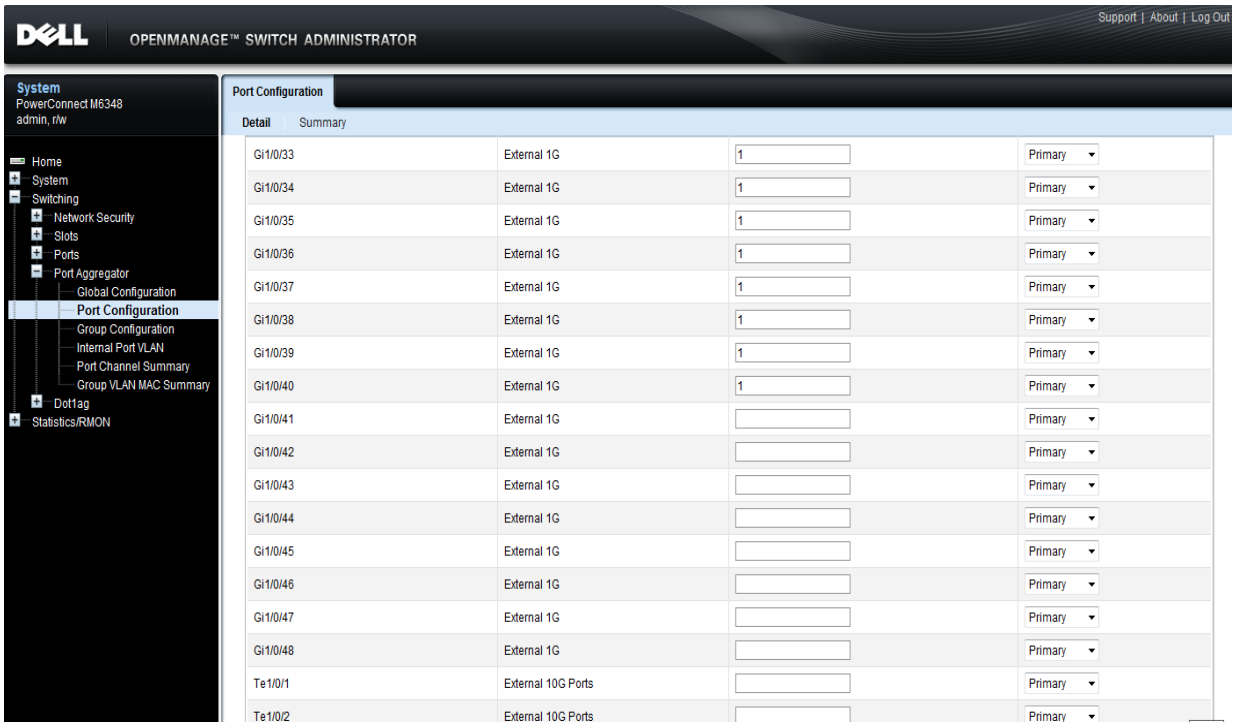

Figure 5: Web Interface for Dell M6348 Switch for Scenario 1

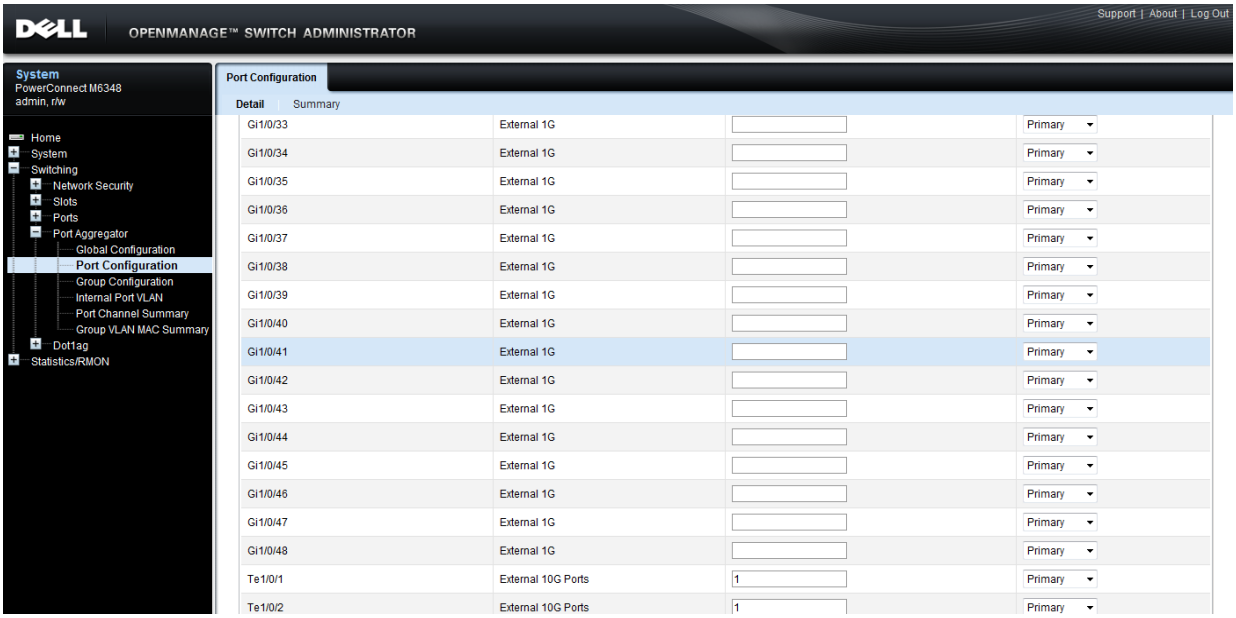

Figure 6: Web Interface for Dell M6348 Switch for Scenario 1

- Click Apply.

Configuring the Cisco 4900M Switch

Configure Link Aggregation Control Protocol (LACP) on Cisco Catalyst switch ports, setting up a 2-port port channel with LACP using the ports to be connected to Dell PowerConnect M6348.

Login to the Catalyst 4900M and make the following changes (Figure 7):

```
Switch(config)#
Switch(config)#int TenGigabitEthernet1/1
Switch(config-if)#channel-protocol lacp
Switch(config-if)#channel-group 1 mode active
Switch(config-if)#exit
Switch(config)#int TenGigabitEthernet1/2
Switch(config-if)#channel-protocol lacp
Switch(config-if)#channel-group 1 mode active
Switch(config-if)#exit
Switch(config)#exit
Switch#
```

Figure 7: Command-Line Interface for Cisco 4900M Catalyst switch for Scenario 1

Scenario 2: Configuring VLANs on the internal ports of the Dell PowerConnect M6348 switch

In this section, we provide an overview of configuring VLANs on the internal ports of the Dell PowerConnect M6348 switch. VLANs allow for greater granularity and quality of service (QoS) control over simple sub-netting, and Dell switches with Simple Switch Mode enabled offer a quick and easy VLAN configuration. In this example we will configure VLANs across the internal ports of the M6348 and then extend these VLANs into the external network by configuring the Cisco Catalyst switch.

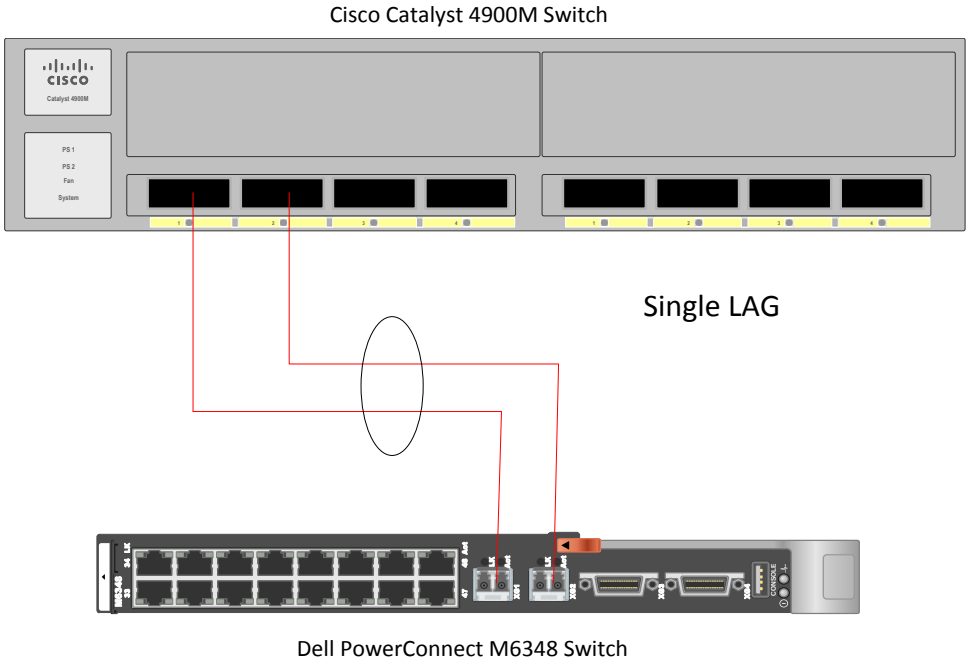

Figure 8: Graphic representation of Scenario 2.

Configuring the Dell M6348 Switch

Command-Line Interface:

Figure 9 shows the command-line interface for configuring the Dell M6348 switch using firmware version 4.1. For details on firmware 3.1 please refere to Appendix A.

```
console(config)#port-aggregator group 1

console(config-portAggr-group-1)#interface gigabitethernet 1/0/1

console(config-portAggr-if-Gi1/0/1)#switchport general allowed vlan add 100 untagged
Warning! This operation changes default vlan of some interface(s).

console(config-portAggr-if-Gi1/0/1)#exit


console(config-portAggr-group-1)#exit

console(config)#exit
```

Figure 9: Command-Line Interface for Dell M6348 Switch for Scenario 2.

Web Interface:

Follow the steps below:

- Select Switching > Port Aggregator > Internal Port VLAN.
- Select any port from the Internal-Port menu. For this example we chose port Gi1/0/1.
- Enter a VLAN number, i.e. 100, in the Untagged-VLAN field (Figure 10).

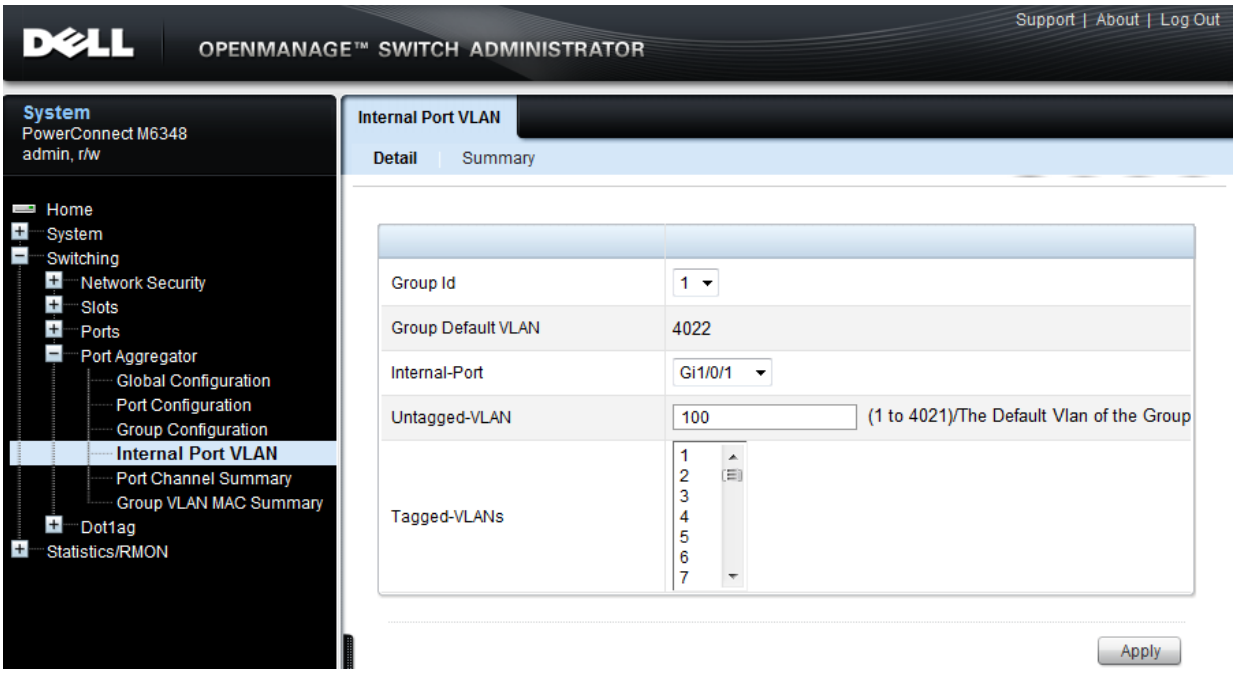

Figure 10: Web Interface for Dell M6348 Switch for Scenario 2.

- Click Apply.

Configuring the Cisco 4900M Switch

Login to the Catalyst 4900M and make the following changes (Figure 11):

```
Switch#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#interface port-channel 1
Switch(config-if)#switchport
Switch(config-if)#switchport trunk allowed vlan 100
Switch(config-if)#switchport mode trunk
Switch(config-if)#interface range te 1/1-2
Switch(config-if-range)#switchport
Switch(config-if-range)#channel-group 1 mode active
Switch(config-if-range)#no shutdown
Switch(config-if-range)#exit
Switch(config)#exit
```

Figure 11: Command-Line Interface for Cisco 4900M Catalyst switch for Scenario 2.

Scenario 3: Configuring multiple VLANs per internal port to connect to a server NIC with Tagging enabled

In this section, we provide an overview of configuring multiple VLANs per internal port to connect to a server NIC with Tagging enabled, which is useful for management of VMs.

- Adding a tagged or untagged VLAN to an internal port will add the same VLAN (tagged only) to all external ports that are members of the same port aggregator group as the internal port. The same VLAN cannot be in multiple aggregator groups on the M6348.

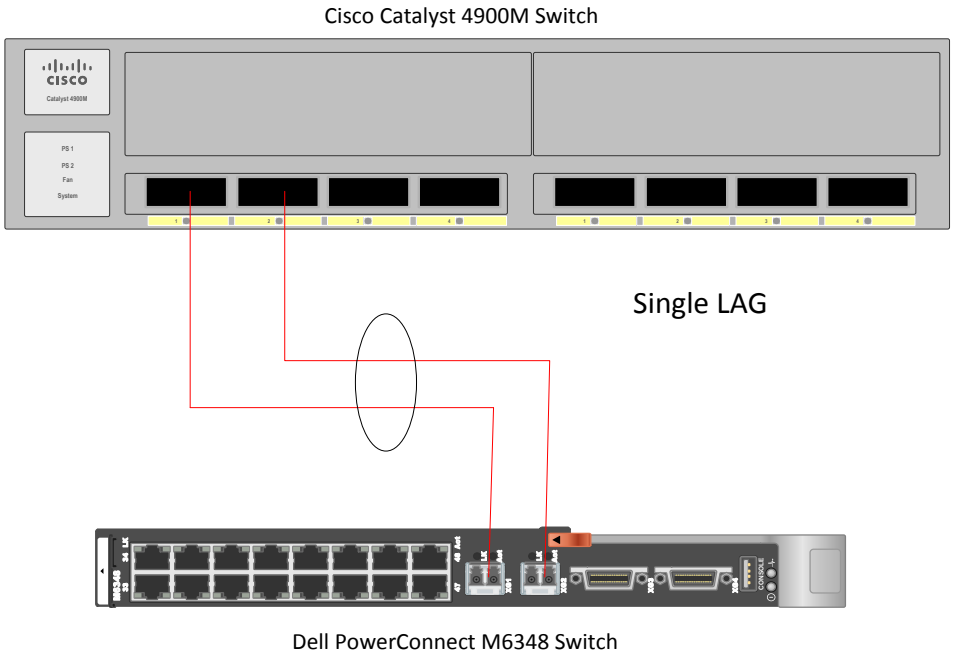

Figure 12: Graphic representation of Scenario 3.

Configuring the Dell M6348 Switch

Command-Line Interface:

Figure 13 shows the command-line interface for configuring Dell M6348 switch using firmware version 4.1. For details on formware 3.1 please refere to Appendix A.

```
console(config)#port-aggregator group 1

console(config-portAggr-group-1)#lacp auto

console(config-portAggr-group-1)#interface gigabitethernet 1/0/1

console(config-portAggr-if-Gi1/0/1)#switchport general allowed vlan add 101-103

console(config-portAggr-if-Gi1/0/1)#exit

console(config-portAggr-group-1)#exit

console(config)#port-aggregator lag-failover
Warning! Please ensure that lacp mode is 'auto' for all groups.

console(config)#exit
```

Figure 13: Command-Line Interface for Dell M6348 Switch for Scenario 3.

Web Interface:

Follow the steps below:

- Select Switching > Port Aggregator > Internal Port VLAN.
- Select a port from the Internal-Port drop-down menu, i.e Gi1/0/1.
- From the Tagged-VLANs list select one or more VLANs, i.e 101-103 (Figure 14).

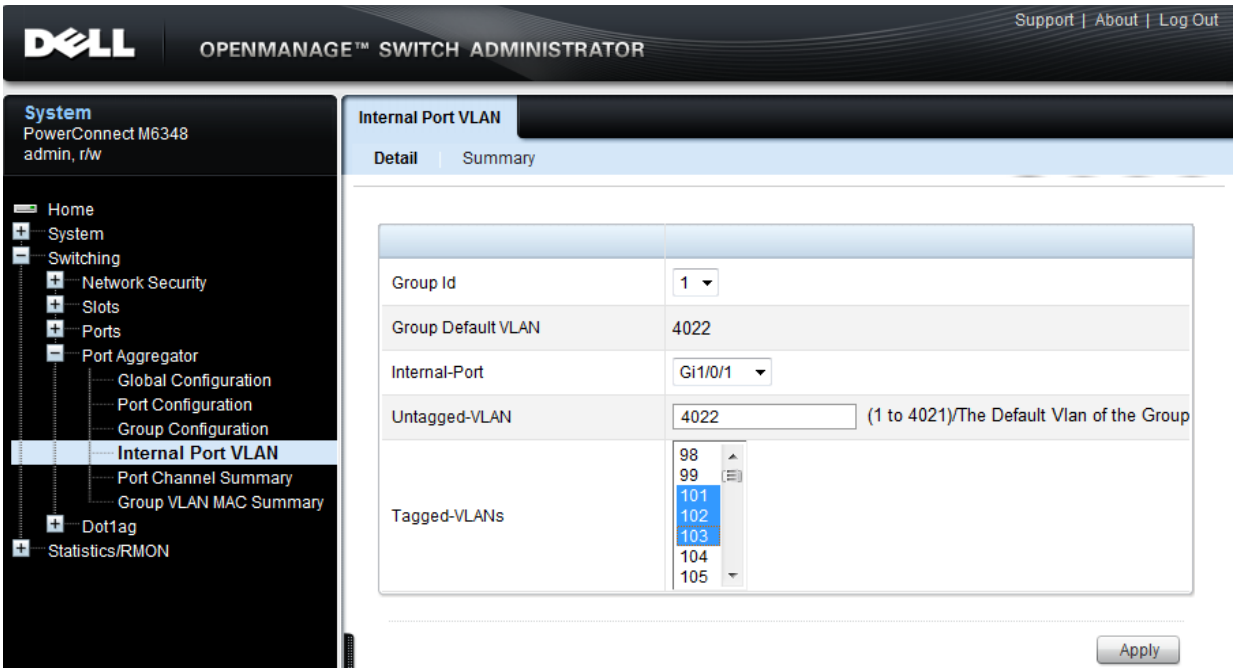

Figure 14: Web Interface for Dell M6348 Switch for Scenario 3.

- Click Apply

Configuring the Cisco 4900M Switch

Login to the Catalyst 4900M and make the following changes (Figure 15):

```
Switch#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#interface port-channel 1
Switch(config-if)#switchport
Switch(config-if)#switchport trunk allowed vlan 101-103
Switch(config-if)#switchport mode trunk
Switch(config-if)#interface range te 1/1-2
Switch(config-if-range)#switchport
Switch(config-if-range)#channel-group 1 mode active
Switch(config-if-range)#no shutdown
Switch(config-if-range)#exit
Switch(config)#exit
Switch#
```

Figure 15: Command-Line Interface for Cisco 4900M Catalyst switch for Scenario 3.

Scenario 4: Configuring multiple Port Aggregation Groups and dedicating specific Uplinks

In this section, we provide an overview of configuring multiple Port Aggregation Groups (AGs to group specific attached blade servers) and dedicating specific Uplinks to carry that traffic to the Cisco Catalyst switch network. Doing this allows us to physically separate traffic for easier administration.

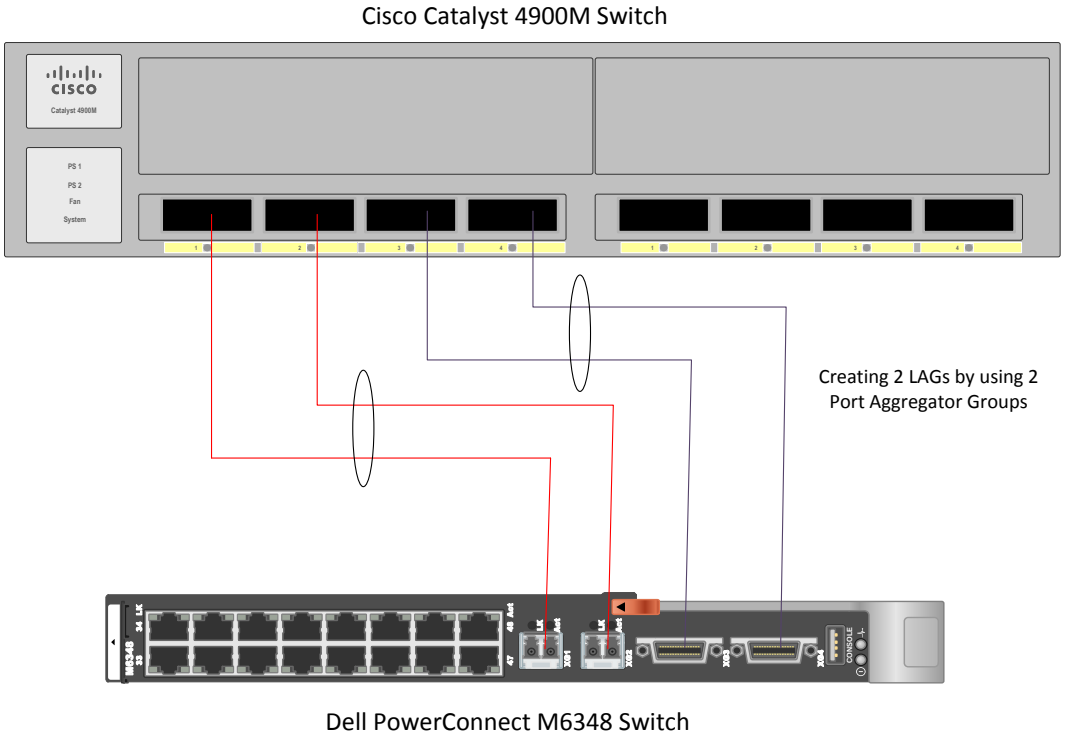

Figure 16: Graphic representation of Scenario 4.

Configuring the Dell M6348 Switch

Command-Line Interface:

Figure 17 shows the command-line interface for configuring the Dell M6348 switch using firmware version 4.1.

```
console(config)#port-aggregator group 1
console(config-portAggr-group-1)#no add interface Gigabitethernet 1/0/17-40
console(config-portAggr-group-1)#add interface Tengigabitethernet 1/0/1-2
console(config-portAggr-group-1)#exit
console(config)#port-aggregator group 2
console(config-portAggr-group-2)#add interface Gigabitethernet 1/0/17-32
console(config-portAggr-group-2)#add interface Tengigabitethernet 1/0/3-4
console(config-portAggr-group-2)#exit
console(config)#exit
```

Figure 17: Command-Line Interface for Dell M6348 Switch for Scenario 4.

Web Interface:

Follow the steps below:

- Select Switching > Port Aggregator > Port Configuration.
- Add **Group 2** ports:
    - Change the group ID of *half* of the internal ports, i.e Gi1/0/17-32, to group 2 (Figure 18).

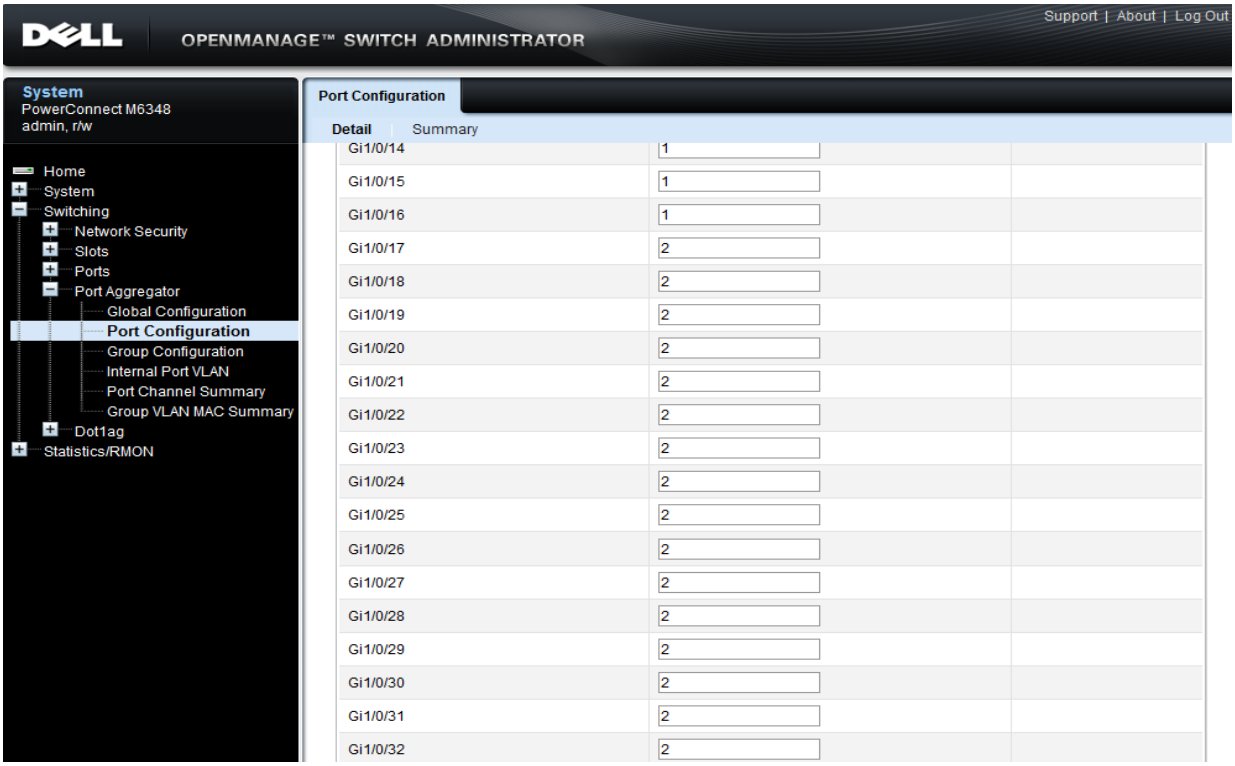

Figure 18: Web Interface for the Dell M6348 Switch for Scenario 4.

- Change the group ID of the external ports you want to use, i.e Te1/0/3-4 to group 2 (Figure 19).

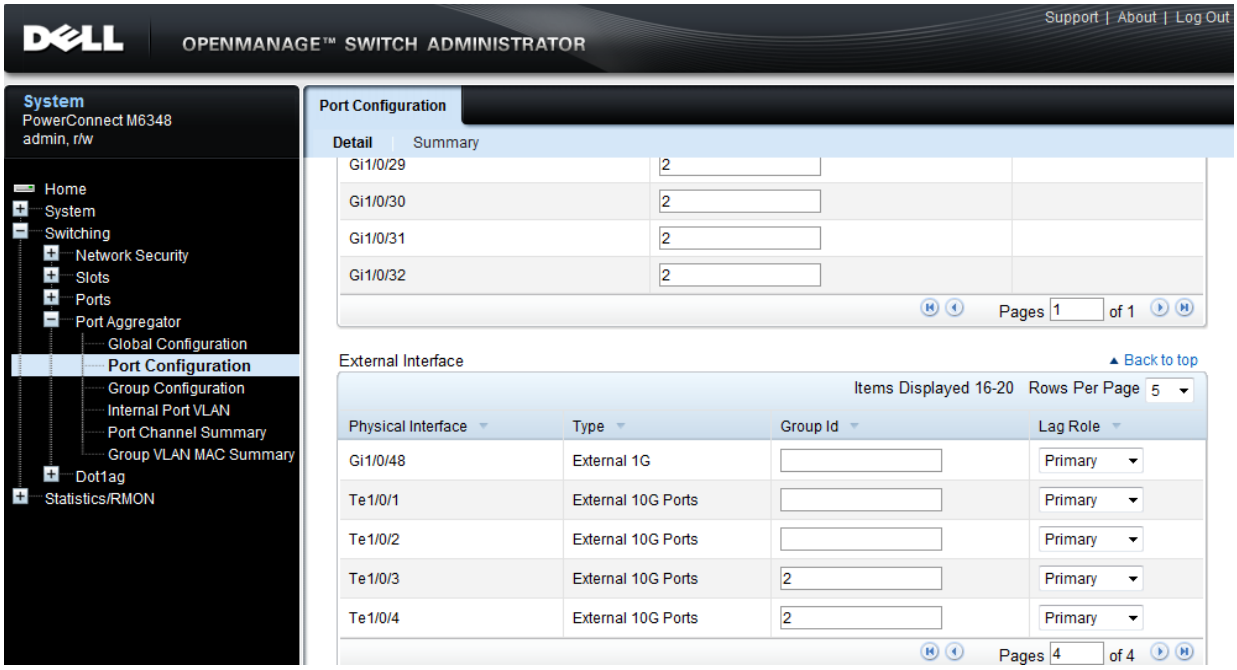

Figure 19: Web Interface for the Dell M6348 Switch for Scenario 4.

- Add Group 1 ports:
    - Verify the group ID of the other half of the internal ports, i.e. Gi1/0/1-16, remains in group 1 (the default for internal ports) (Figure 20).

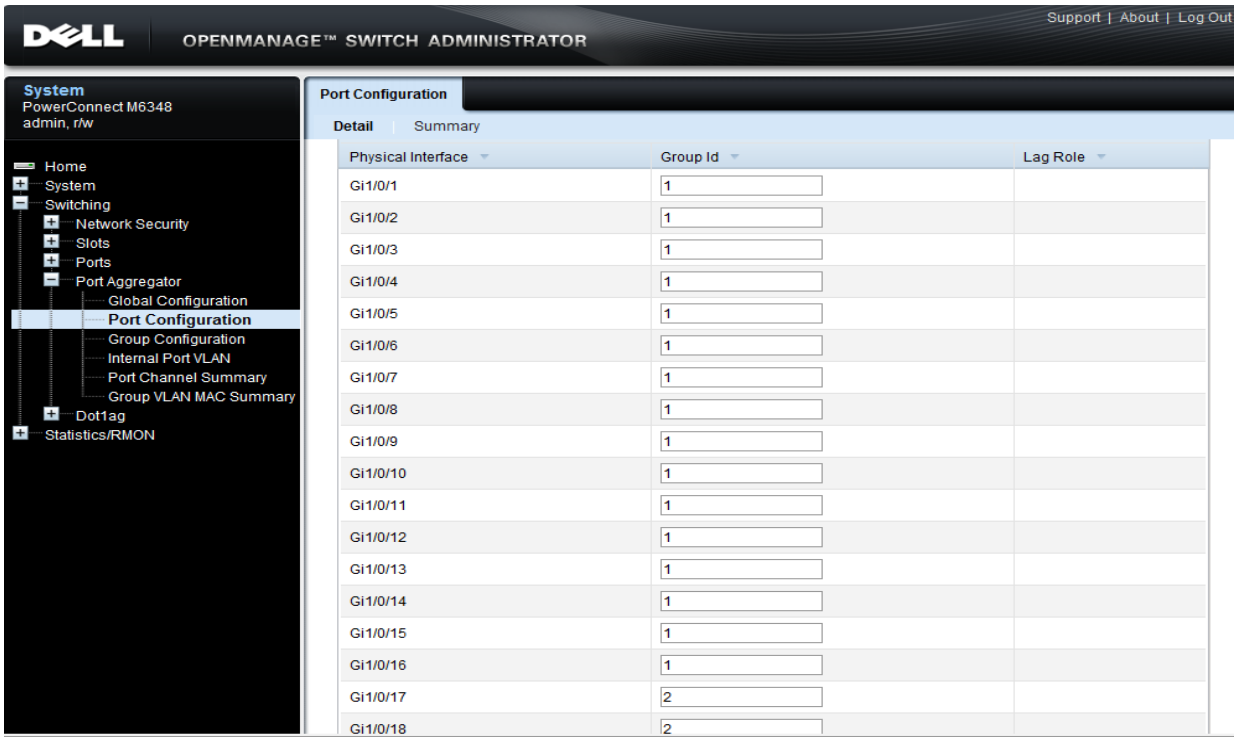

Figure 20: Web Interface for Dell M6348 Switch for Scenario 4.

- Remove the group ID from all *default* external ports, i.e. Gi1/0/33-40 (Figure 21).

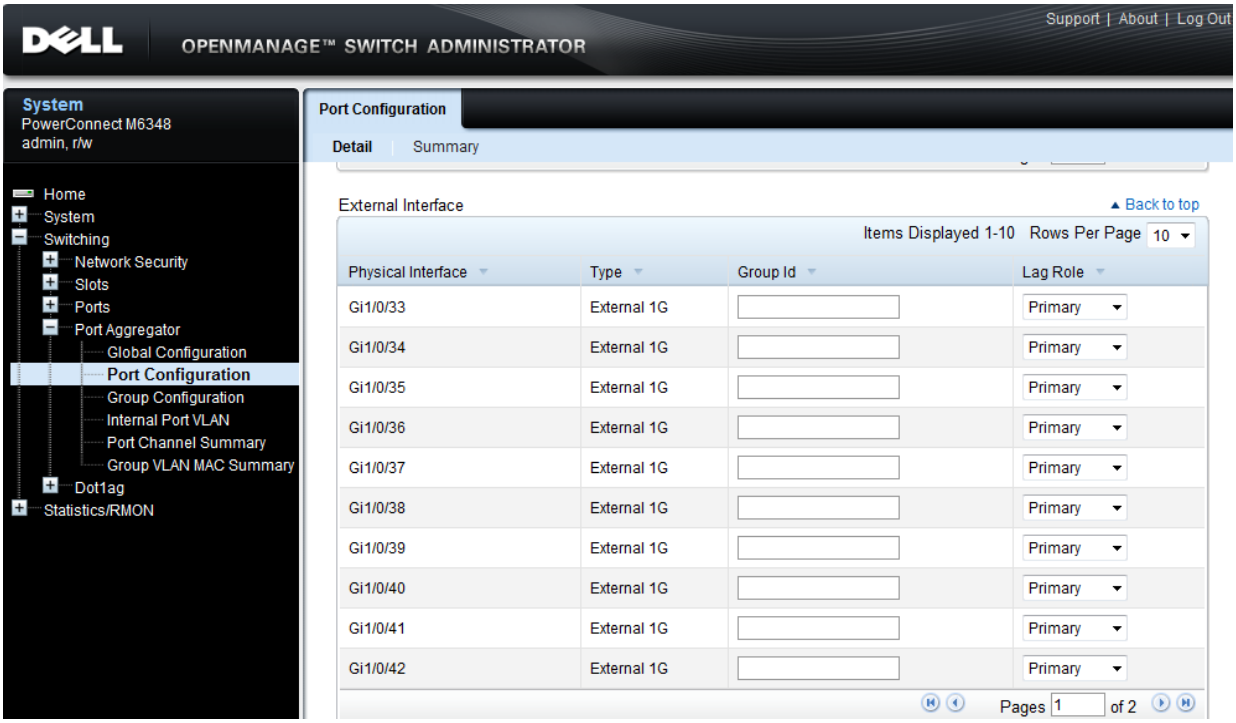

Figure 21: Web Interface for Dell M6348 Switch for Scenario 4.

- Change the group ID of the external ports you want to use, i.e. Te1/0/1-2, to group 1 (Figure 22).

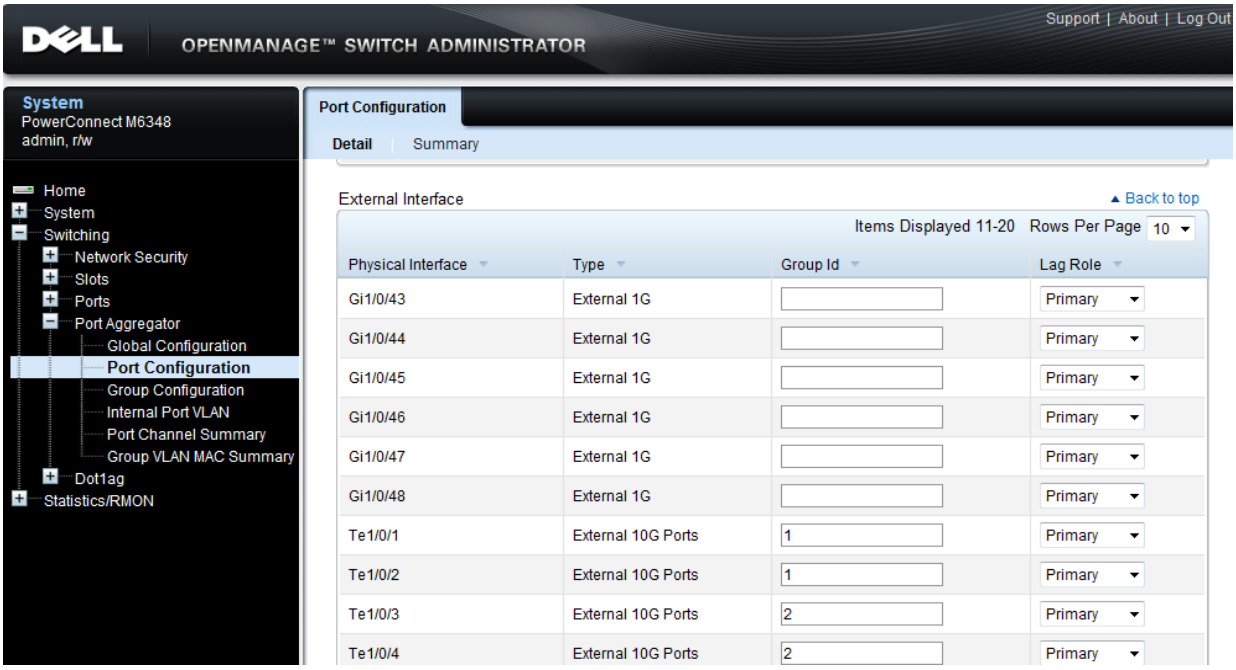

Figure 22: Web Interface for Dell M6348 Switch for Scenario 4.

- Click Apply

Configuring the Cisco 4900M Switch

Login to the Catalyst 4900M and enter the following commands (Figure 23) to configure port channels and add them to the ports. In this example we are adding ports 1-2 to port-channel 1 and ports 3-4 to port-channel 2.

```
Switch#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#interface port-channel 1
Switch(config-if)#switchport
Switch(config-if)#switchport access vlan 110
Switch(config-if)#interface port-channel 2
Switch(config-if)#switchport
Switch(config-if)#switchport access vlan 111
Switch(config-if)#exit
Switch(config)#interface range TenGigabitEthernet 1/1-2
Switch(config-if-range)#switchport
Switch(config-if-range)#channel-group 1 mode active
Switch(config-if-range)#no shutdown
Switch(config-if-range)#exit
Switch(config)#interface range TenGigabitEthernet 1/3-4
Switch(config-if-range)#switchport
Switch(config-if-range)#channel-group 2 mode active
Switch(config-if-range)#no shutdown
Switch(config-if-range)#exit
Switch(config)#exit
```

Figure 23: Command-Line Interface for Cisco 4900M Catalyst switch for Scenario 4.

Scenario 5: Adding VLANs in a multi-AG configuration

In this section, we provide an overview of adding VLANs in a multi-AG configuration, which combine the advantages of virtual network administration with physical network separation.

- The Tengigabitethernet ports 1/0/3 and 1/0/4 used in this example on the M6348 are CX4s and will require your Catalyst 4900M to have X2-CX4-10G modules installed in order to connect the second LAG.
- Ports Tengigabitethernet 1/0/3 and 1/0/4 on the M6348 are in stacking mode by default. You will need toggle them to ethernet mode to establish links to the Catalyst 4900M.

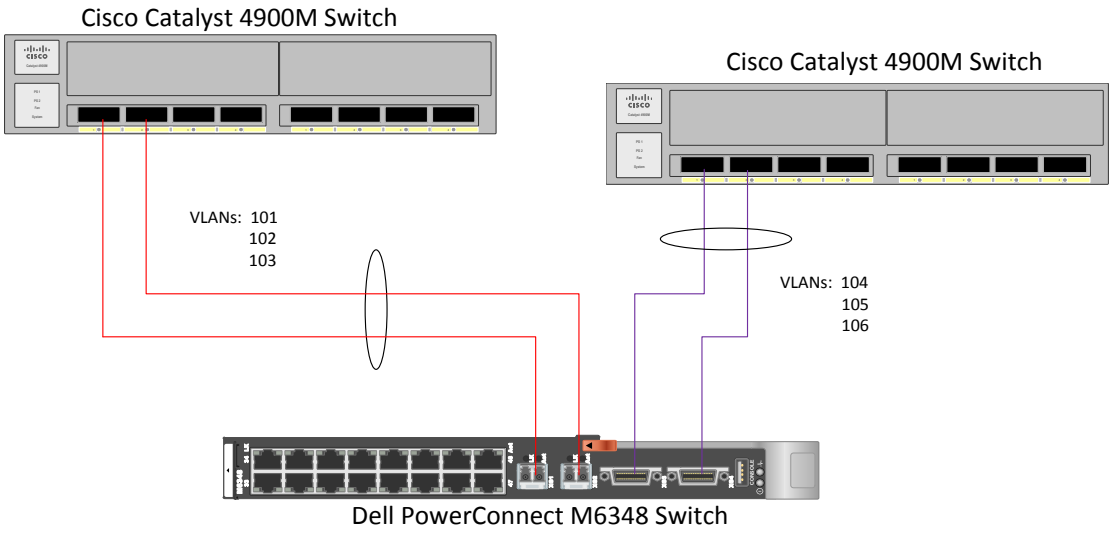

Figure 24: Graphic representation of Scenario 5.

Configuring the Dell M6348 Switch

Command-Line Interface:

Figure 25 shows the command-line interface for configuring Dell M6348 switch using firmware version 4.1.

```
console(config)#port-aggregator group 1
console(config-portAggr-group-1)#no add interface Gigabitethernet 1/0/17-40
console(config-portAggr-group-1)#add interface Tengigabitethernet 1/0/1-2
console(config-portAggr-group-1)#interface Gigabitethernet 1/0/1
console(config-portAggr-if-Gi1/0/1)#switchport general allowed vlan add 101-103
console(config-portAggr-if-Gi1/0/1)#exit
console(config-portAggr-group-1)#exit
console(config)#port-aggregator group 2
console(config-portAggr-group-2)#add interface Gigabitethernet 1/0/17-32
console(config-portAggr-group-2)#add interface Tengigabitethernet 1/0/3-4
console(config-portAggr-group-2)#interface Gigabitethernet 1/0/17
console(config-portAggr-if-Gi1/0/17)#switchport general allowed vlan add 104-106
console(config-portAggr-if-Gi1/0/17)#exit
console(config-portAggr-group-2)#exit
console(config)#exit
```

Figure 25: Command-Line Interface for Dell M6348 Switch for Scenario 5.

Web Interface:

Follow the steps below:

- Select Switching > Port Aggregator > Port Configuration.
- Add **Group 2** ports:
    - Change the group ID of *half* of the internal ports, i.e. Gi1/0/17-32, to group 2 (Figure 26).

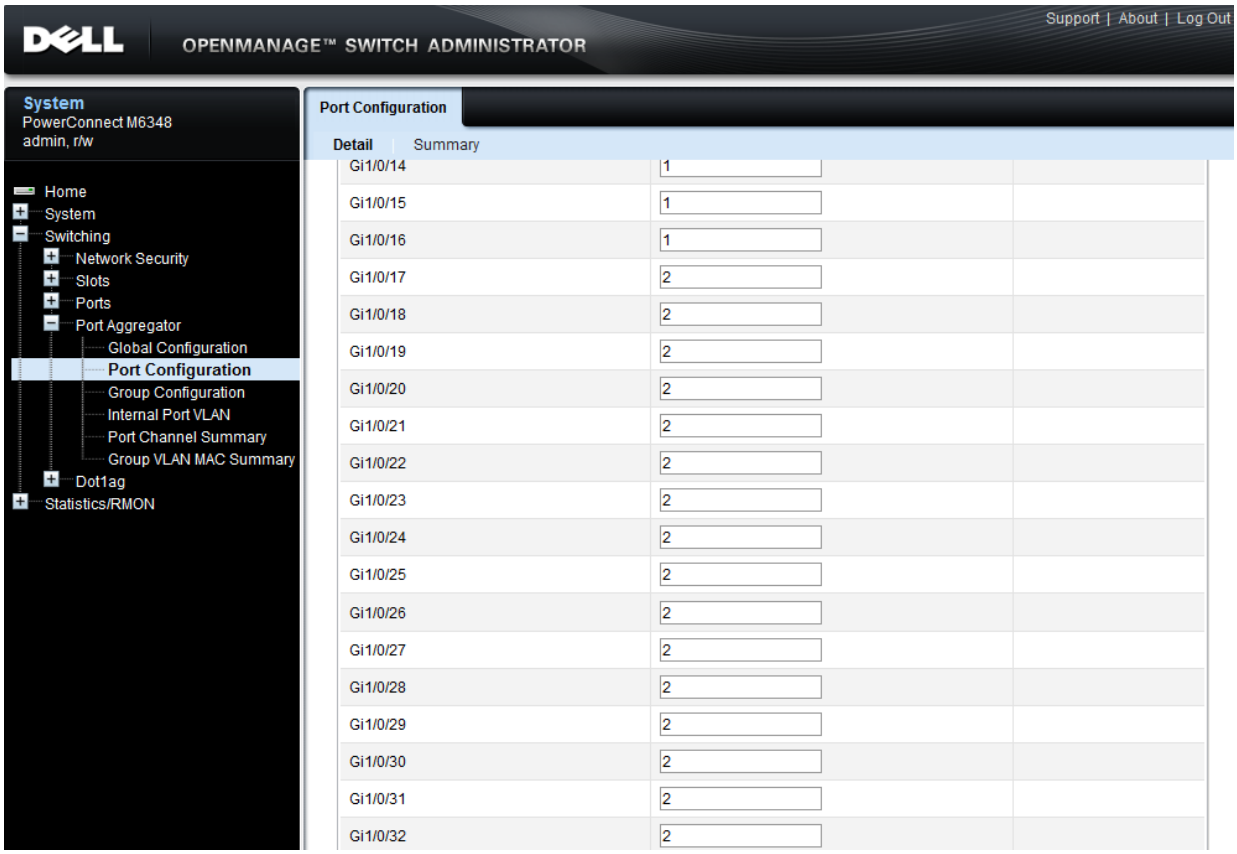

Figure 26: Web Interface for Dell M6348 Switch for Scenario 5.

- Change the group ID of the external ports you want to use, i.e. Te1/0/3-4, to group 2 (Figure 27).

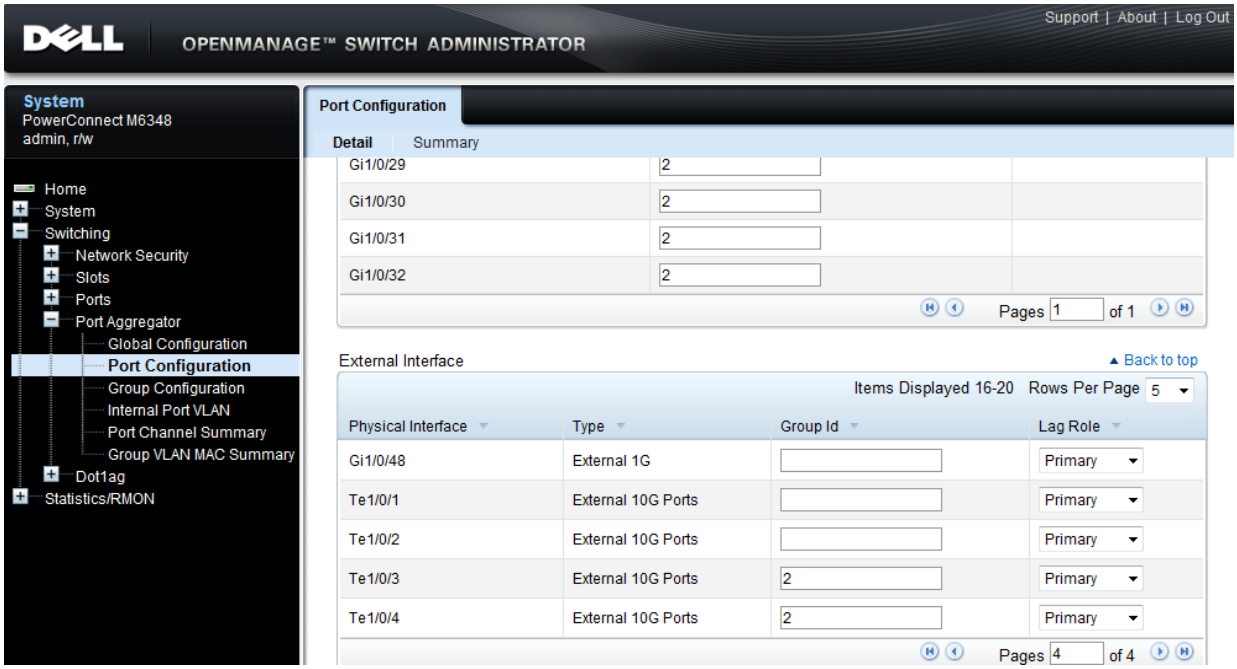

Figure 27: Web Interface for Dell M6348 Switch for Scenario 5.

- Add **Group 1** ports:
  - Verify the group ID of the *other half* of the internal ports, i.e. Gi1/0/1-16, remains in group 1 (the default for internal ports) (Figure 28).

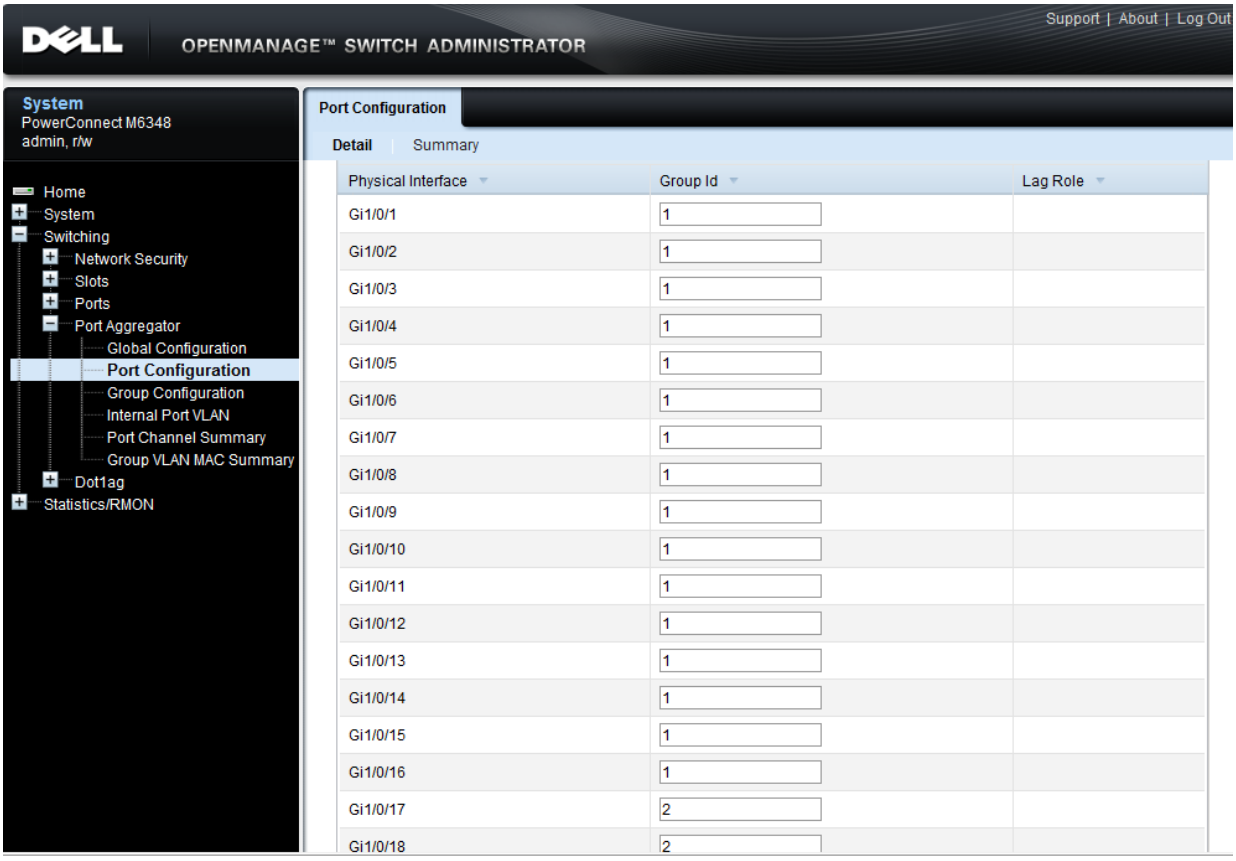

Figure 28: Web Interface for Dell M6348 Switch for Scenario 5.

- Remove the group ID from all *default* external ports, i.e. Gi1/0/33-40 (Figure 29).

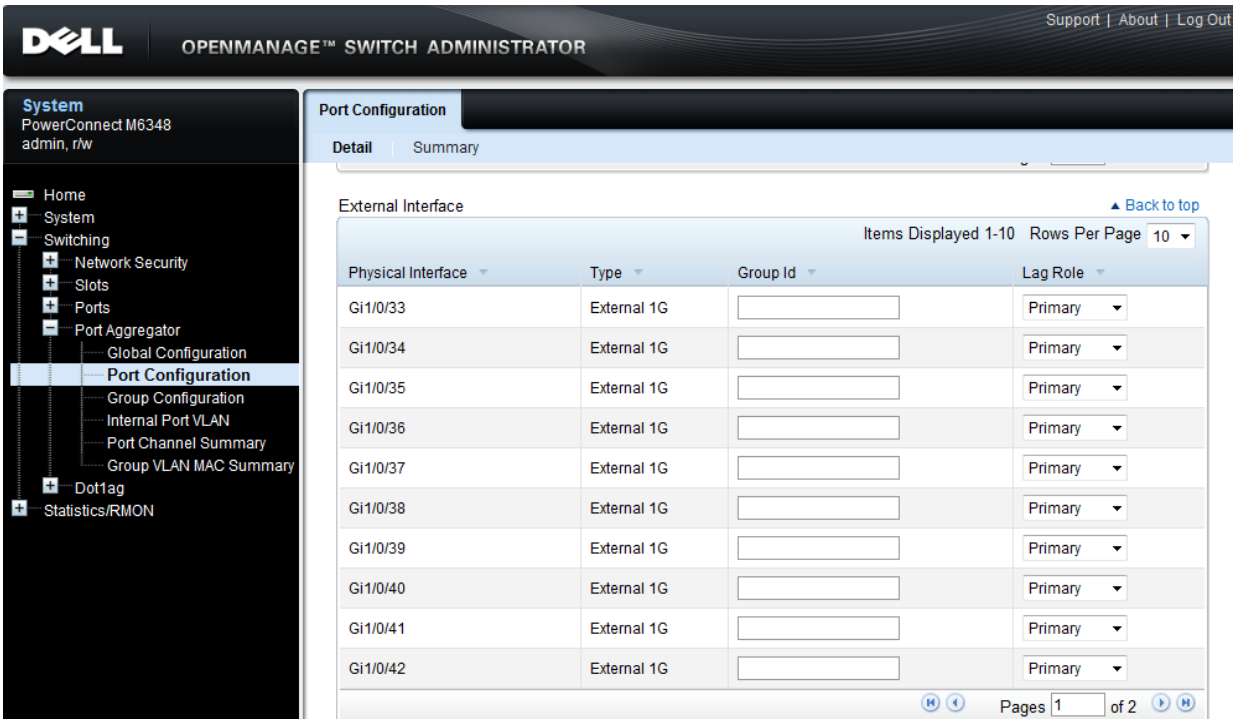

Figure 29: Web Interface for Dell M6348 Switch for Scenario 5.

- Change the group ID of the external ports you want to use, i.e. Te1/0/1-2, to group 1 (Figure 30).

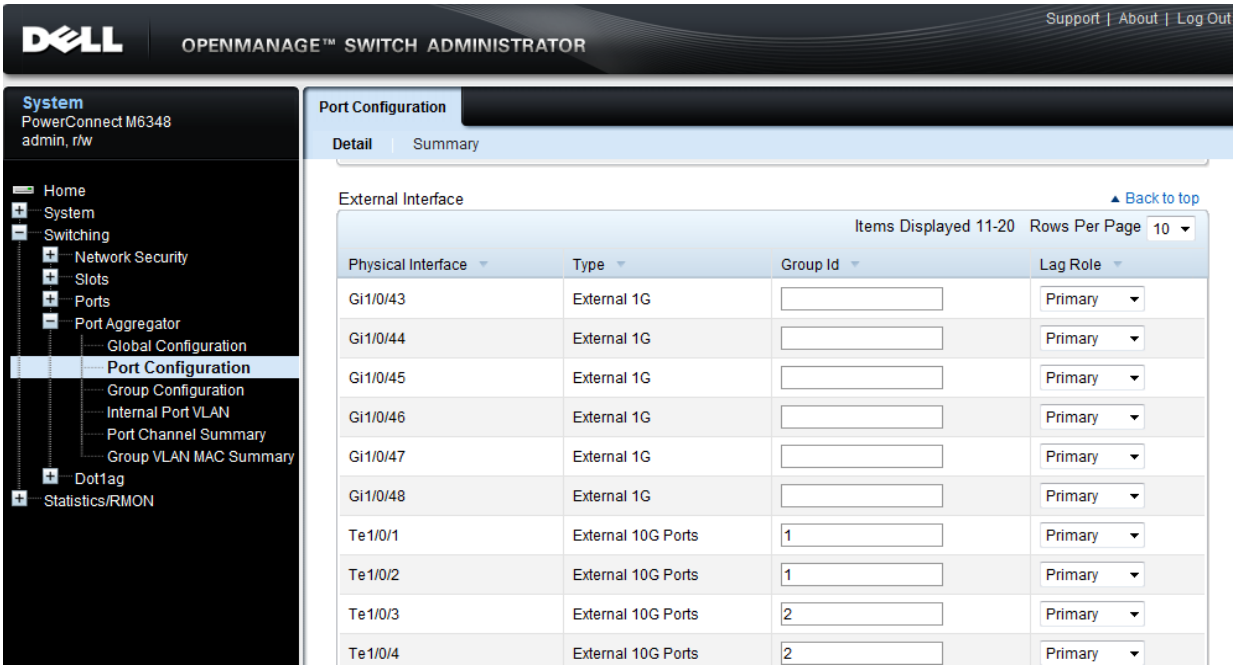

Figure 30: Web Interface for Dell M6348 Switch for Scenario 5.

- Click Apply

Follow these next steps to assign internal port VLANs.

- Select Switching > Port Aggregator > Internal Port VLAN
- Make sure Group Id is set to 1.
- Select a port from the Internal-Port drop-down menu, i.e. Gi1/0/1.
- In the Tagged-VLANs menu, select the VLANs, i.e. 101-103, for this port (Figure 31).

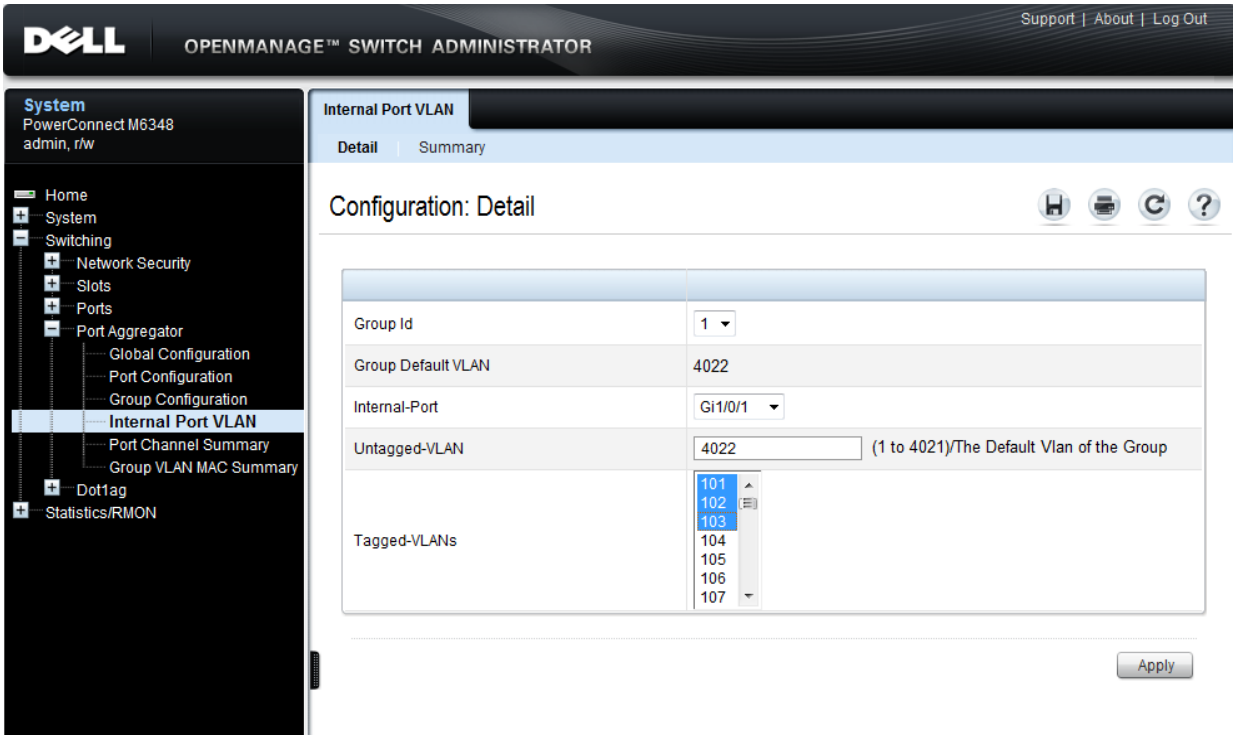

Figure 31: Web Interface for Dell M6348 Switch for Scenario 5.

- Click Apply.
- Change the Group Id to 2.
- Select a port from group 2 using the Internal-Port drop-down menu, i.e. Gi1/0/17.
- In the Tagged-VLANs menu, select the VLANs, i.e. 104-106, for this port (Figure 32).

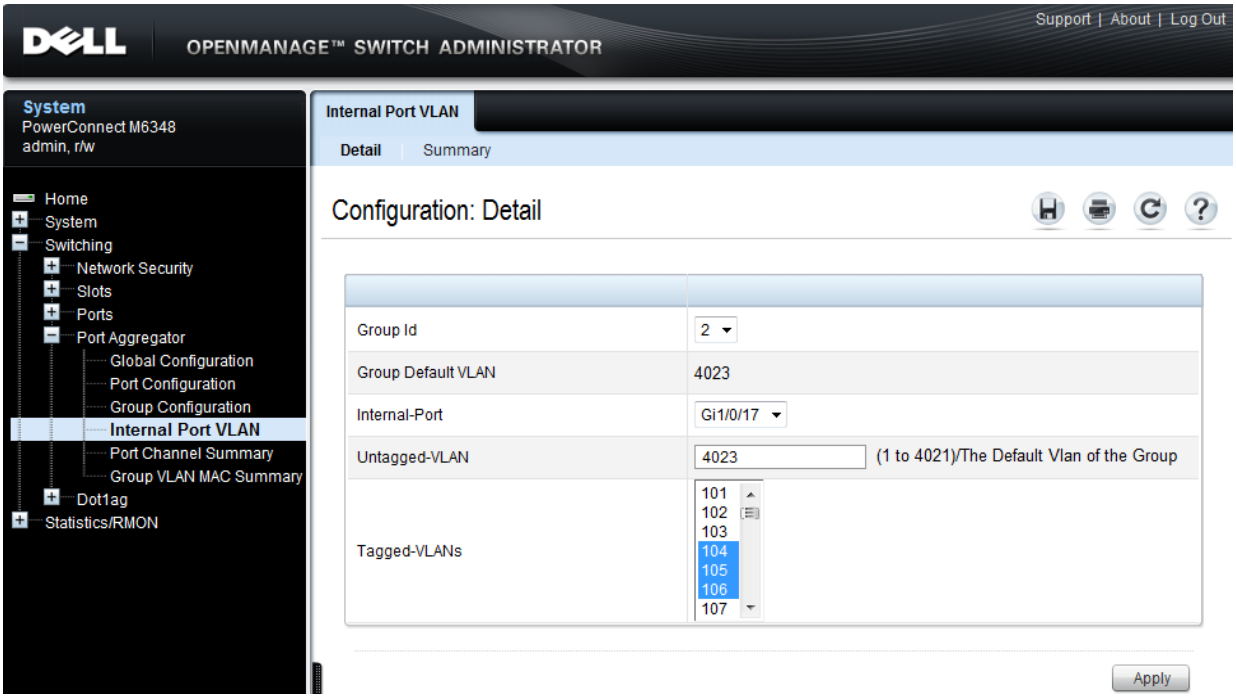

Figure 32: Web Interface for Dell M6348 Switch for Scenario 5.

- Click Apply.

Configuring the Cisco 4900M Switch

Login to the first Catalyst and enter the following commands (Figure 33) to configure trunking and multiple VLANs on a port-channel.

```
Switch#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#interface port-channel 1
Switch(config-if)#switchport
Switch(config-if)#switchport trunk allowed vlan 101-103
Switch(config-if)#switchport mode trunk
Switch(config-if)#interface range te 1/1-2
Switch(config-if-range)#switchport
Switch(config-if-range)#channel-group 1 mode active
Switch(config-if-range)#no shutdown
Switch(config-if-range)#exit
Switch(config)#exit
```

Figure 33: Command-Line Interface for Cisco 4900M Catalyst switch for Scenario 5.

Login to the second Catalyst and enter the following commands (Figure 34) to again configure trunking and multiple VLANs on a port-channel.

```
Switch#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#interface port-channel 1
Switch(config-if)#switchport
Switch(config-if)#switchport trunk allowed vlan 104-106
Switch(config-if)#switchport mode trunk
Switch(config-if)#interface range te 1/1-2
Switch(config-if-range)#switchport
Switch(config-if-range)#channel-group 1 mode active
Switch(config-if-range)#no shutdown
Switch(config-if-range)#exit
Switch(config)#exit
```

Figure 34: Command-Line Interface for Cisco 4900M Catalyst switch for Scenario 5.

Scenario 6: Setting up a LAG backup for failover

In this section, we provide an overview of setting up a straight-through topology with LAG failover. Simple Switch Mode LAG failover allows Dell switches to automatically change from the primary to the backup LAG in the event of a port failure, reducing potential downtime.

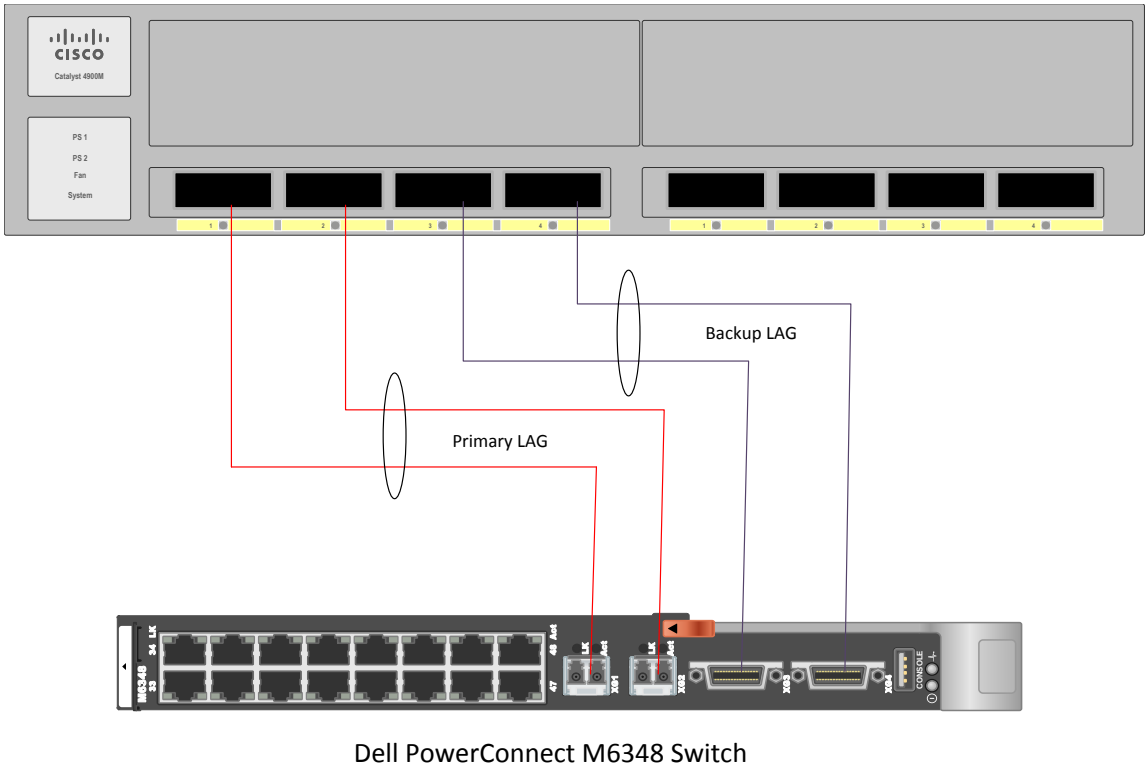

Figure 35: Graphic representation of Scenario 6.

Configuring the Dell M6348 Switch

Command-Line Interface:

If you are using the M6348 CLI, enter the following commands to remove all external 1Gig ports from port-aggregator group 1. Then add two external 10Gig ports to group 1 as the primary LAG and another two external 10Gig ports to group 1 as the secondary LAG. Figure 36 shows the command-line interface for configuring Dell M6348 switch using firmware version 4.1.

```
console#config
console(config)#port-aggregator group 1
console(config-portAggr-group-1)#no add interface Gigabitethernet 1/0/33-48
console(config-portAggr-group-1)#add interface Tengigabitethernet 1/0/1-2
console(config-portAggr-group-1)#add interface Tengigabitethernet 1/0/3-4 secondary
console(config-portAggr-group-1)#exit
console(config)#exit
```

Figure 36: Command-Line Interface for Dell M6348 Switch for Scenario 6.

Web Interface:

Follow the steps below:

- Select Switching > Port Aggregator > Port Configuration
- In the Port Configuration screen, make ports Te1/0/1-4 members of Group Id 1.
- Remove the 1 from the Group Id fields for ports Gi1/0/33-48.
- Verify the Lag Role fields for Te1/0/1 and Te1/0/2 are set to Primary.
- Change the Lag Role of ports Te1/0/3 and Te1/0/4 to 2 Secondary (Figure 37).

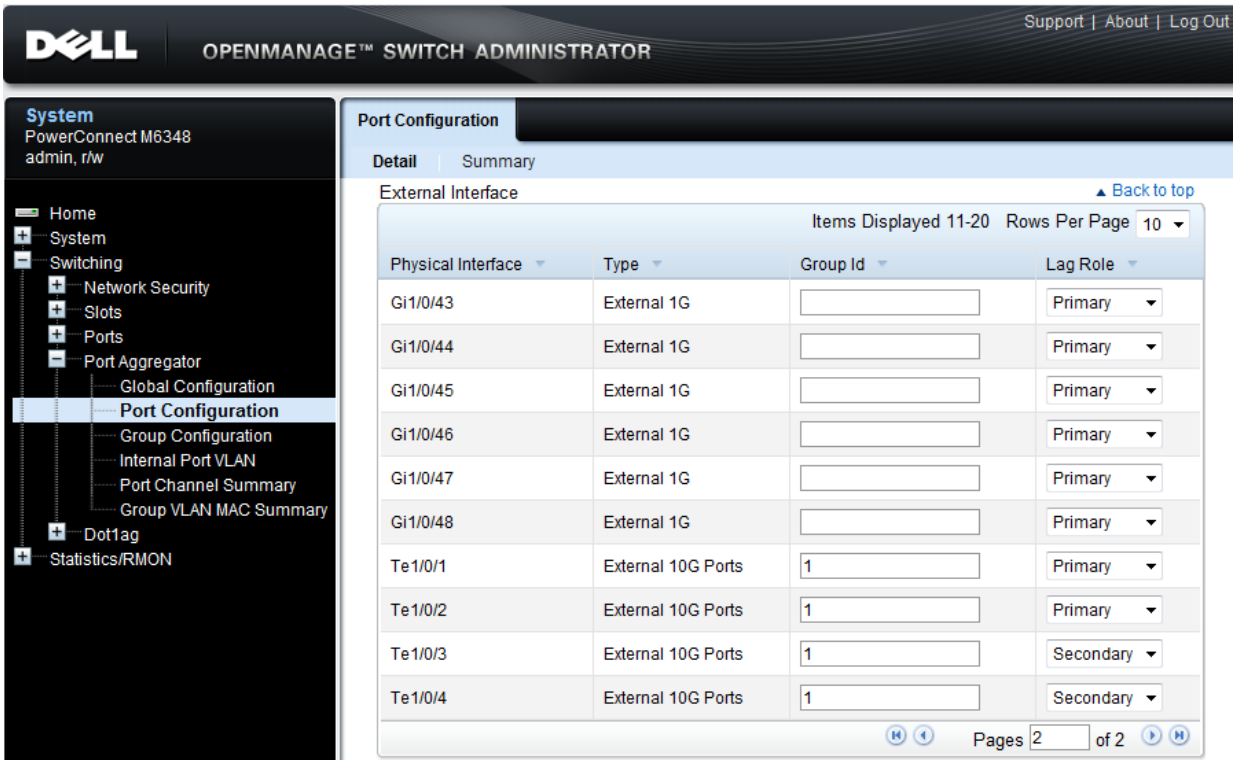

Figure 37: Web Interface for Dell M6348 Switch for Scenario 6.

- Click Apply.

Configuring the Cisco 4900M Switch

Login to the Catalyst 4900M and make the following changes (Figure 38):

```
Switch#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#interface port-channel 1
Switch(config-if)#switchport
Switch(config-if)#switchport access vlan 101
Switch(config-if)#interface port-channel 2
Switch(config-if)#switchport
Switch(config-if)#switchport access vlan 101
Switch(config-if)#interface range te 1/1-2
Switch(config-if-range)#switchport
Switch(config-if-range)#channel-group 1 mode active
Switch(config-if-range)#no shutdown
Switch(config-if-range)#interface range te 1/3-4
Switch(config-if-range)#switchport
Switch(config-if-range)#channel-group 2 mode active
Switch(config-if-range)#no shutdown
Switch(config-if-range)#exit
Switch(config)#exit
```

Figure 38: Command-Line Interface for Cisco 4900M Catalyst switch for Scenario 6.

APPENDIX A – M6348 SCREENS USING FIRMWARE 3.1

This appendix shows how the commands in this document look if you are using firmware version 3.1.x.x on your M6348. Examples are shown for the scenarios 1 through 3 only.

Dell recommends that you run the latest firmware available for your device.

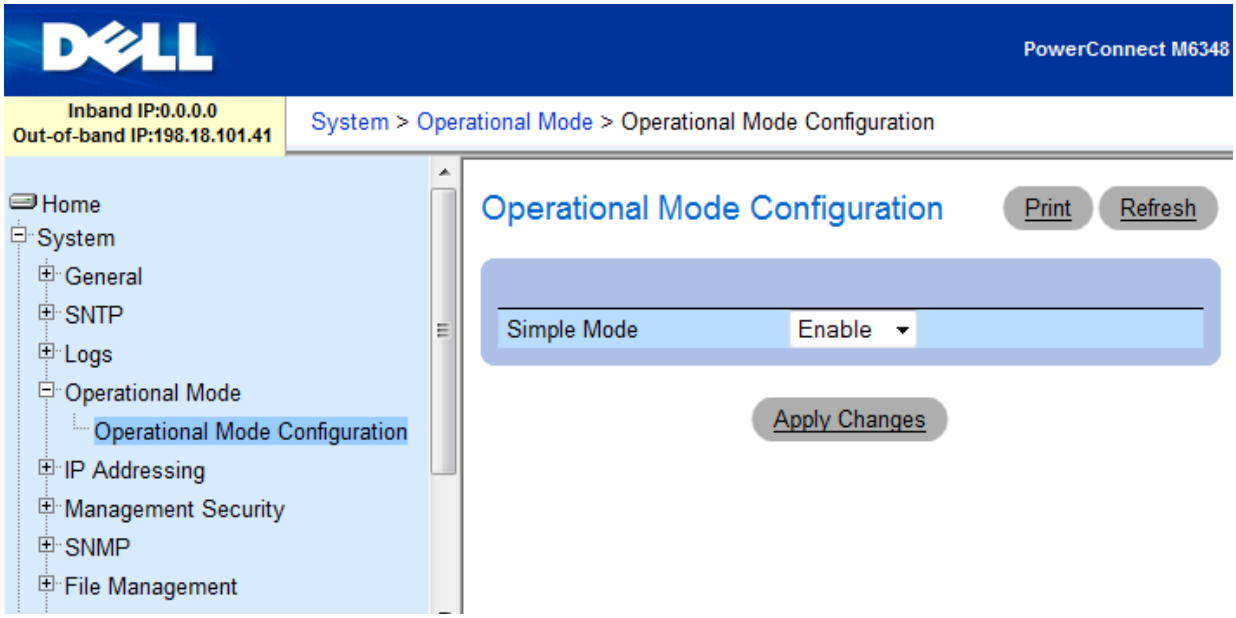

Figure A1: Introduction: Enabling Simple Mode

```
console#configure
console(config)#port-aggregator group 1
console(config-portAggr-group-1)#no add ethernet 1/g33-1/g40
console(config-portAggr-group-1)#add ethernet 1/xg1-1/xg2
console(config-portAggr-group-1)#exit
console(config)#exit
console#
```

Figure A2: Scenario 1: Plug and play the Dell PowerConnect M6348 switch

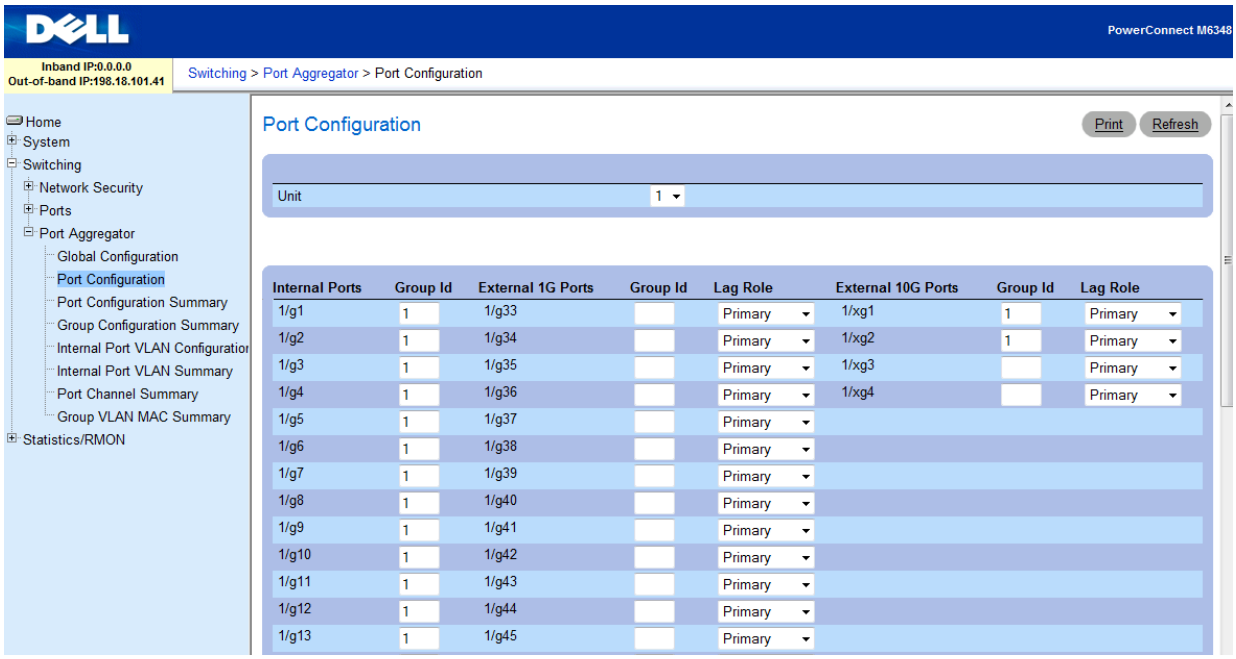

Figure A3: Scenario 1: Plug and play the Dell PowerConnect M6348 switch

```
console#configure

console(config)#port-aggregator group 1

console(config-portAggr-group-1)#interface ethernet 1/g1

console(config-portAggr-if-1/g1)#switchport general allowed vlan add 100 untagge
Warning! This operation changes default vlan of some interface(s).

console(config-portAggr-if-1/g1)#exit


console(config-portAggr-group-1)#exit

console(config)#exit

console#
```

Figure A4: Scenario 2: Configuring VLANs on the internal ports of the Dell PowerConnect M6348 switch

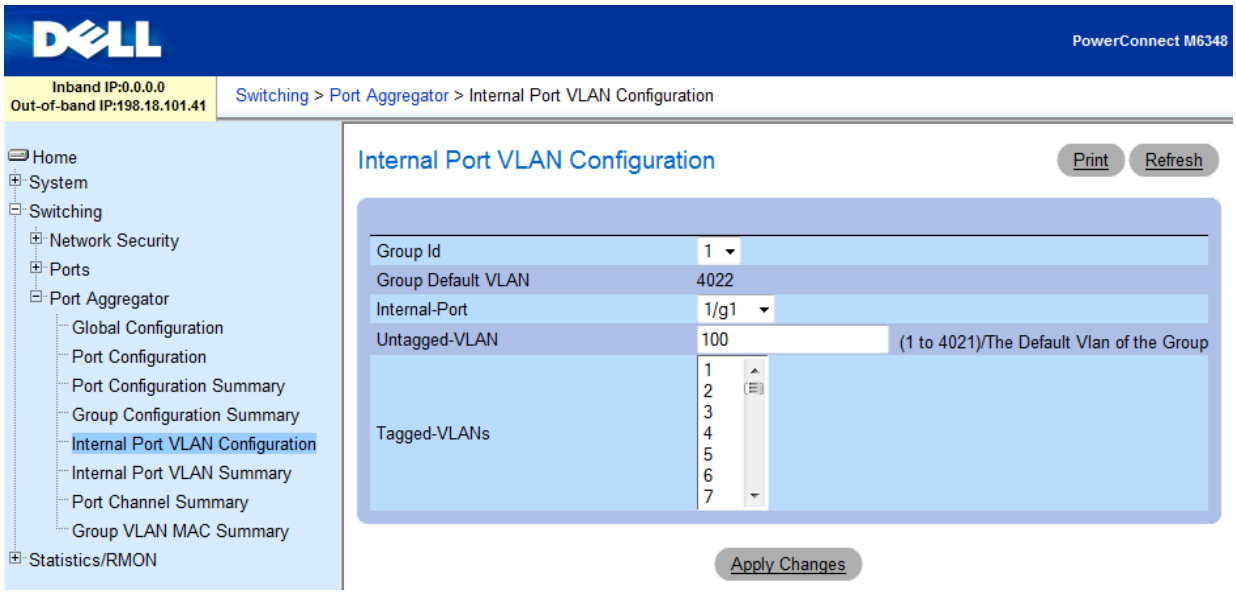

Figure A5: Scenario 2: Configuring VLANs on the internal ports of the Dell PowerConnect M6348 switch

```
console#config

console(config)#port-aggregator group 1

console(config-portAggr-group-1)#lacp auto

console(config-portAggr-group-1)#interface ethernet 1/g1

console(config-portAggr-if-1/g1)#switchport general allowed vlan add 101-103

console(config-portAggr-if-1/g1)#exit

console(config-portAggr-group-1)#exit

console(config)#port-aggregator lag-failover
Warning! Please ensure that lacp mode is 'auto' for all groups.

console(config)#exit
```

Figure A6: Scenario 3: Configuring multiple VLANs per internal port to connect to a server NIC with Tag enabled

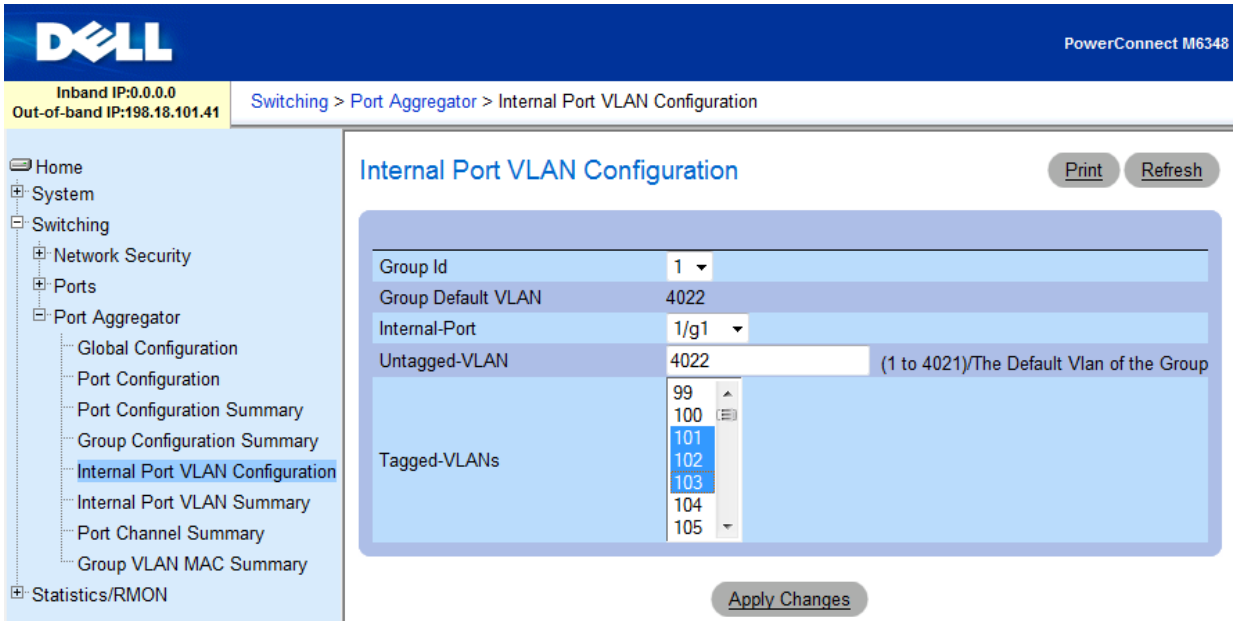

Figure A7: Scenario 3: Configuring multiple VLANs per internal port to connect to a server NIC with Tag enabled

APPENDIX B - NETWORK SWITCH VERSIONS

Version information for the network switches we used are as follows:

Network switch	Dell PowerConnect M6348	Cisco Catalyst 4900M
Software version	3.1.5.7 and 4.1.0.6	12.2(54)SG1 (fc1)

Figure B1: Switch Firmware Versions

ABOUT DELL

Dell (NASDAQ: DELL) is a leading technology provider to commercial and public enterprises around the world.